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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/550,256	09/22/2005	Donald Edwin Hargraves	2974/2US	1625
23638 7590 11/14/2008 ADAMS INTELLECTUAL PROPERTY LAW, P.A. Suite 2350 Charlotte Plaza 201 South College Street CHARLOTTE, NC 28244				
EXAMINER				
KIM, JOHN K				
ART UNIT		PAPER NUMBER		
2834				
MAIL DATE		DELIVERY MODE		
11/14/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/550,256

**Applicant(s)**

HARGRAVES ET AL.

**Examiner**

JOHN K. KIM

**Art Unit**

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10/20/2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-5,7,13-17 and 19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3-5, 7, 13-17 and 19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 7/11/2007, 7/10/2008
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. This Office action is in response to papers filed on 20 September 2008. Amendments made to the claims and Applicant's remarks have been entered and considered.
2. Claims 1, 3-5, 7, 13-17 and 19 are pending and are presented for examination. Claims 1 and 13 have been amended. Claim 2 has been cancelled.

### Response to Arguments

3. Claim objections are withdrawn as it has been amended or explained.
4. Applicant amended claim with new limitations and therefore arguments moot.
5. Besides, Applicant's arguments have been fully considered but they are not persuasive. See NEMA/UL temperature national standard, that optimal temperature range is selectable from classes.

Temperature Tolerance Class	Maximum Operation Temperature Allowed		Allowable Temperature Rise at full load 1.0 service factor motor <sup>1)</sup>	Allowable Temperature Rise 1.15 service factor motor <sup>1)</sup>
	°C	°F	°C	°C
A	105	221	60	70
B	130	266	80	90
F	155	311	105	115
H	180	356	125	-

***Response to Amendment***

6. The examiner reviewed amended claims and remarks as follows.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 1, 5, 13, 14 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fries (US 5237228) in view of Naman (US 6822354).

As for claim 1, Fries teaches (in Fig. 1) an electrical machine, comprising: a housing assembly (4) having first (5) and second ends (14); a first bearing (8) mounted in said housing, said first bearing having a plurality of rolling elements disposed between first inner and outer races; a second bearing (15) mounted in said housing and

spaced away from said first bearing (8), said second bearing having a plurality of rolling elements disposed between second inner and outer races; a rotor assembly (1-2) having first and second ends mounted in said first and second bearings (8, 15), respectively, such that said rotor has a predetermined amount of axial and radial play relative to said housing (inherent clearance for manufacturing); and a biasing element (10) disposed between one of said rotor assembly (1-2) or said housing and one of said bearings (8), said biasing element (10) urging said rotor assembly to a preloaded position which eliminates said axial and radial play, wherein said first inner race and said second inner race are secured to said rotor assembly (1-2), and said first outer race and said second outer race are secured to said housing (12, at 14) to restrict axial movement of each of said first inner race and said second inner race relative to said rotor assembly and said first outer race and said second outer race relative to said housing (intended use of bearings), such that said rotor assembly (1-2) is retained in said preloaded position. Fries however failed to clearly teach wherein the coefficients of thermal expansion of said housing assembly, said bearings, and said rotor are selected so that said rotor assembly will be retained in said preloaded position over a temperature range of about -40 degree C to about 105 degree C. In the same field of endeavor, Naman teaches motor temperature of operation between 110 degree C and -40 degree (col. 4, line 48-67) which is close enough to the range in the invention. Furthermore, it is well known for those skilled in the art that many of commercial motors are designed under class A insulation by NEMA and UL standard and the maximum temperature of A class insulation is 105 degree C (see NEMA/UL Table above), and for

magnet, especially for ferrite family magnet, the lower allowable temperature is -40 degree C or higher depending on the thickness of the magnet, and it is due to demagnetization region. If such magnet is exposed below that temperature, the magnet is losing the power permanently. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teaching of Naman with that of Fries to set within safe operation range, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

As for claim 5, Fries and Naman teach the claimed invention as applied to claim 1 above. Fries further teaches (in Fig. 1) said housing assembly (4) comprises: a generally cylindrical housing including an axially extending portion (4) with a front end plate (5) connected to a front end thereof; and an end bell (14) attached to a rear end of said housing.

As for claim 13, Fries teaches (in Fig. 1) an electric motor, comprising: a generally cylindrical housing assembly (4) having first (5) and second ends (14), said housing defining first and second spaced-apart bearing pockets (12 and at 14); a first bearing (8) having a plurality of rolling elements disposed between first inner and outer races, said first outer race being received in said first bearing pocket (12); a second bearing (15) having a plurality of rolling elements disposed between second inner and outer races, said second outer race being received in said second bearing pocket (at 14); a rotor assembly (2) including a shaft (1) received in said first and second inner

aces, such that said rotor (2) has a predetermined amount of axial and radial play relative to said housing (4); and a biasing element (10) disposed between one of said rotor assembly (2) or said housing and one of said bearings (8) which urges said rotor assembly to a preloaded position which eliminates said axial and radial play, wherein said first inner and second inner races are secured to said shaft (1), and said first outer races and second outer races are secured to said housing (12, at 14) to restrict axial movement of each of said first inner race and said second inner race relative to said rotor assembly and said first outer race and said second outer race relative to said housing (intended use of bearings), such that said rotor assembly is retained in said preloaded position. Fries however failed to clearly teach wherein the coefficients of thermal expansion of said housing assembly, said bearings, and said rotor are selected so that said rotor assembly will be retained in said preloaded position over a temperature range of about -40 degree C to about 105 degree C. In the same field of endeavor, Naman teaches motor temperature of operation between 110 degree C and -40 degree (col. 4, line 48-67) which is close enough to the range in the invention. Furthermore, it is well known for those skilled in the art that many of commercial motors are designed under class A insulation by NEMA and UL standard and the maximum temperature of A class insulation is 105 degree C (see NEMA/UL Table above), and for magnet, especially for ferrite family magnet, the lower allowable temperature is -40 degree C or higher depending on the thickness of the magnet, and it is due to demagnetization region. If such magnet is exposed below that temperature, the magnet is losing the power permanently. Thus, it would have been obvious to one having

ordinary skill in the art at the time the invention was made to combine the teaching of Naman with that of Fries to set within safe operation range, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

As for claim 14, Fries and Naman teach the claimed invention as applied to claim 13 above. Fries further teaches (in Fig. 1) said first and second outer races are secured to said housing (12, 14), and said first and second inner races are secured to said shaft (1).

As for claim 17, except claim dependency, claim 17 contains the same limitation as claim 5 and is rejected for the same reason set forth in connection with the rejection of claim 5 above.

10. Claims 3 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fries (US 5237228) in view of Naman (US 6822354) and in further view of Otsuka (US 6023113).

As for claim 3, Fries and Naman teach the claimed invention as applied to claim 1 above. Fries, however, failed to teach or suggest biasing element comprises a spring disposed between rotor assembly and said first or second inner race. In the same field of endeavor, Otsuka teaches (in Fig. 1) biasing element comprises a spring (7) disposed between rotor assembly (6) and first or second inner race (of 3). Therefore, it



would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of Otsuka with those of Fries and Naman for protection of spring by having the spring rotates with shaft.

As for claim 15, except claim dependency, claim 15 contains the same limitation as claim 3 and is rejected for the same reason set forth in connection with the rejection of claim 3 above.

11. Claims 4 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fries (US 5237228) in view of Naman (US 6822354) and in further view of Sato (US 5497040).

As for claim 4, Fries and Naman teach the claimed invention as applied to claim 1 above. Fries, however, failed to teach or suggest said biasing element comprises a spring (10) disposed between said housing and said first or second outer race. In the same field of endeavor, Sato teaches (in Fig. 1) biasing element comprises a spring (15) disposed between housing (2) and said first or second outer race (of 6). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of Sato with those of Fries and Naman for protection of spring by having the spring does not rotate with shaft.

As for claim 16, except claim dependency, claim 16 contains the same limitation as claim 4 and is rejected for the same reason set forth in connection with the rejection of claim 4 above.

12. Claims 7 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fries (US 5237228) in view of Naman (US 6822354) and Noguchi et al (US 5639168) and in further view of Johnatakis et al (US 5134328), Nishimura (US 6495941) and Kan et al (US 6528909).

As for claim 7, Fries and Naman teach the claimed invention as applied to claim 1 above. Fries however failed to teach said bearings are constructed from high carbon chromium steel and said housing assembly and said rotor assembly are constructed from 400 series stainless steel. In the same field of endeavor, Noguchi teaches (in Fig. 1) bearings are constructed from high carbon chromium steel. (Col. 8, line 55-57) Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of Noguchi with that of Fries for high speed drive. Noguchi however failed to teach housing assembly and rotor assembly are constructed from 400 series stainless steel. In the same field of endeavor, Johnatakis et al (US 5134328) and Nishimura (US 6495941) teach housing assembly and rotor assembly are constructed from stainless steel, respectively. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of Johnatakis and Nishimura with those of Fries, Naman and Noguchi for moisture resistive. Johnatakis and Nishimura however failed to teach the stainless steel is 400 series SUS steel. In the same field of invention, Kan teaches use of 400 series stainless steel in the motor assembly. (col. 7, line 40-55) Therefore, it would have been obvious to one having ordinary skill in the art at the time

the invention was made to combine the teaching of Kan with those of Fries, Naman, Noguchi, Johnatakis and Nishimura to select 400 series from stainless steel group, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

As for claim 19, except claim dependency, claim 19 contains the same limitation as claim 7 and is rejected for the same reason set forth in connection with the rejection of claim 7 above.

### ***Conclusion***

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Following references are not used for above office action but it will be useful for teaching of the invention disclosed. Paillet (US 4471246), Fritchman (US 4632644), Shiga et al (US 6930430) and Kuwako et al (US 3936680) show a grooved rotor to insert a spring. As shown in Fritchman, grooved rotor has been traditionally used in refrigerator compressor using a single phase induction motor. Motors in Paillet and Kuwako are permanent magnet motor same as the disclosed invention.

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN K. KIM whose telephone number is (571)270-5072. The fax phone number for the examiner where this application or proceeding is assigned is 571-270-6072. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Quyen Leung can be reached on 571-272-8188.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Quyen P Leung/  
Supervisory Patent Examiner, Art Unit 2834

JK